COLORADO RIVER RECOVERY PROGRAM **Project No.: C-6-rz recruitment**
FY-2004 SCOPE OF WORK for:
(Razorback sucker migration/recruitment from floodplain depressions)

Lead Agency: Utah Division of Wildlife Resources
Submitted by: Kevin D. Christopherson
Utah Division of Wildlife
Northeast Regional Office
152 East 100 North
Vernal, Utah 84078
435-789-3103/fax: 435-789-8343
E-mail: kevinchristopherson@utah.gov

Date: May 14, 2003 (revised 6/3/03 by Pat Nelson; revised 9/3/03, 1/21/04, 1/29/04 by Ron Brunson, 2/9/04 by Pat Nelson)

Category:
_ Ongoing project
_ Ongoing-revised project
X Requested new project
_ Unsolicited proposal

Expected Funding Source:
X Annual funds
_ Capital funds
_ Other (explain)

I. Title of Proposal:

Evaluation of razorback sucker migration and recruitment from floodplain depressions into the mainstem middle Green River.

II. Relationship to RIPRAP:

GENERAL RECOVERY PROGRAM SUPPORT ACTION PLAN
II Restore Habitat (Habitat Development and Maintenance)
II.A. Restore flooded bottomland habitats.

GREEN RIVER ACTION PLAN: MAINSTEM
II. Restore Habitat (Habitat Development and Maintenance)
II.A. Restore and manage flooded bottomland habitat.
II.A.2.a Identify and evaluate floodplain sites
II.A.3. Implement levee removal strategy at high-priority sites.
II.A.3.d. Evaluation.

III. Study Background/Rationale and Hypotheses:

Based on the assumption that floodplain wetlands provide critical rearing habitat for razorback suckers the Recovery Program initiated an extensive floodplain habitat restoration program (Levee Removal) in 1996. The goal of the Levee Removal Program is to restore natural floodplain wetland habitats and functions that support the recovery of endangered fish (specifically the razorback sucker) (Lentsch et al. 1996). To accomplish

this goal, levees at selected wetlands have been lowered to increase the frequency of riverine-floodplain connection to pre-Flaming Gorge Dam levels. As part of the Levee Removal Program, a study was designed to monitor native and nonnative fish utilization of floodplain wetlands from 1996 through 1998. However, because there were very few razorback suckers reproducing in the system, answers to several important questions pertaining to razorback sucker utilization of the floodplain were not answered during the initial Levee Removal Study. These questions were: 1) Can larval razorback suckers be entrained in the floodplain by lowering levees to improve the riverine-floodplain connection? 2) Can they be entrained at high enough numbers to ensure some survival from predation by nonnative fish and piscivorous insects? 3) Will razorback suckers survive, voluntarily migrate from the floodplain during high flows and recruit in to the river population? 4) If so, what cues trigger migration from the floodplain? We have successfully answered the previous two questions. Ninety millimeter TL razorback suckers stocked into floodplain wetlands survive and grow to be healthy fish that voluntarily migrate into the main river through levee breaches. We are still lacking answers to the latter two questions. This proposed project would evaluate the size and age that razorback suckers migrate to the river and identify environmental cues that encourage this movement.

We propose evaluating the size and age at which razorback suckers migrate to the river. Environmental cues will also be evaluated. This information will further refine our management of these floodplain depressions to facilitate survival, recruitment, and ultimately the recovery of razorback suckers.

Hypothesis statement: Size and/or age as well as environmental cues play important roles in encouraging razorback sucker migration from floodplain depressions to the main stem river.

IV. Study Goals, Objectives, End Product:

Study Goal and Objective

Evaluate razorback sucker migration from floodplain environments to the mainstem river.

Objective:

Determine optimal size and/or age and environmental cues for razorback sucker to migrate to the mainstem river.

End Product

Report and management recommendations on migration of razorback suckers stocked into floodplain depressions into the mainstem river.

V. Study area:

The Stirrup floodplain depression on the middle Green River (RMI 275.8)

VI. Study Methods/Approach:

The Stirrup floodplain will be intensively sampled prior to river-floodplain connection using fyke nets. All razorback sucker and bonytail over 120mm will be PIT tagged. As the site connects, the breach will be monitored for fish passage using fyke nets. Fish passage will also be monitored by electrofishing in the main channel adjacent to The Stirrup floodplain during the river-floodplain connection.

Availability of Age-1 and Age-2 razorback sucker in 2004:

Age-1 ~ 200 salvaged from Baeser survival study in 2003
Age-2 - 1,000 fish currently in Stirrup from 2002 survival study

Table 1. Expected age structure of razorback sucker in the Stirrup floodplain assuming no migration: 2004 - 2006.

	Year		
Age Class	2004	2005	2006
Age-1	~200 from previous study		
Age-2	1,000+	100+ carryover	
Age-3		500+ carryover	50+ carryover
Age-4			250+ carryover

1) Environmental cues will be monitored up to and during connection.

Water quality at the site will be monitored in 24 hour blocks, one or two times per week. Parameters to be checked include temperature, DO, pH, depth, and water clarity. Water quality will also be monitored in the river.

2) The study will end when the river disconnects.

VII. Task Description and Schedule

Task 1: Sample and mark razorback sucker and bonytail

April 2004

Task 2: Field data collection

April - July 2004

Task 3: Data coordination, entry and analysis

October - November 2004

Task 4: Report preparation

Annual RIP Report November 2004

VIII FY-2004 Work

1. Deliverables/due dates: annual report 14 November 2004

2. Budget:

Task 1: Sample and mark razorback sucker in The Stirrup

	Work days	Cost
Labor-		
Biologist (315/day)	10	3,150
Technician (180/day)	40	7,200
Travel ($35/day/vehicle)	10	350
Equipment (fyke net replacement)		1,000
Supplies-		300
Task 1 Total		12,000

Task 2: Monitor migration

	Work days	Cost
Labor-		
Biologist (315/day)	14	4,410
Technician (180/day)	14	2,520
Travel ($35/day/vehicle)	14	490
Equipment-		250
Supplies-		200
Task 2 Total		7,870

Task 3: Data entry and analysis

	Work days	Cost
Labor-		
Project Leader (405/day)	3	1,215
Biologist (315/day)	5	1,575
Technician (180/day)	5	900
Supplies-		500
Task 3 Total		4,190

Task 4: Report preparation

	Work days	Cost
Labor-		
Project Leader (405/day)	2	810
Biologist (315/day)	4	1,260
Technician (180/day)	2	360
Task 4 Total		2,430

FY2004 TOTAL	$26,490

IX. Budget Summary

FY-2004	$26,490
Total	$26,490

X. Reviewers:

XI References

Hamman, R.L. 1987. Survival of razorback suckers cultured in earthen ponds. The Progressive Fish Culturist 49:138-140.

Lentsch, L., T. Crowl, P. Nelson, and T. Modde. 1996. Levee removal strategic plan. Utah Division of Wildlife Resources, Salt Lake City, Utah. 21 pp.

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Papoulias, D. and W.L. Minckley. 1992. Effects of food availability on survival and growth of larval razorback suckers in ponds. Transactions of the American Fisheries Society 121:340 - 354.

Utah Division Wildlife (UDWR). Investigation of larval and juvenile razorback sucker survival to recruitment in floodplain depressions in the presence of non-native fishes. *Work in progress.*

Utah Division of Wildlife Resources (UDWR). The Levee Removal Project: Assessment of floodplain habitat restoration in the middle Green River. *Work in progress*.